

RELATIONSHIP AMONG INTELLIGENCE, SELF-CONCEPT, STUDY HABITS AND ACHIEVEMENT IN MATHEMATICS OF SECONDARY STUDENTS

Author's Name: ¹Asis Ghosh, ²Dr. Kartic Chandra Paramanic

Affiliation: ¹Yogoda Satsanga Palpara Mahavidyalaya, Palpara, Purba Madinipur, West Bengal, India

²Bankura University, Bankura, West Bengal, India

E-Mail: ghoshasis31@gmail.com

DOI No. – 08.2020-25662434

Abstract

In the study investigator find out the correlation coefficient between Intelligence, Study habits and Self-concept with Achievement in Mathematics. Hence achievement in Mathematics is dependent variable and independent variables are intelligence, study habits and Self-concept. 400 secondary students of class IX are the sample of the study. To analysis the data investigator has been used descriptive statistics and significances of correlation coefficient Major findings are i) there are significant correlations between Achievement in Mathematics and Intelligence ($r=0.683$); ii) Achievement in Mathematics and Study habits ($r=0.316$); iii) Achievement in Mathematics and Self-concept ($r=0.282$). Among the variables Intelligence strongly correlated with Achievement in Mathematics in comparison to Study habits and Self-concept.

Keywords: Achievement in Mathematics, Intelligence, Study habits Self-concept.

INTRODUCTION

For growth and development of a nation, mathematics plays a vital role. So, mathematics is an important discipline in the school curriculum. Many countries give attention in students performance in mathematics. The knowledge and skills of students in mathematics are essential in their daily life in overcoming the difficulties that one may face (Mohamed and Waheed, 2011). That is why there is an emphasis on the lessons that should be taught in mathematics in schools at different levels around the world than any other subject (Orton and Frobisher, 2004). Now, from different standardized national examination in mathematics it is proved that student's performance in mathematics is very lower that the expected level. This underachievement in mathematics is a big problem all over the world which concern specifically in high school. Intelligence, study habits and self-concept are the factors that influence the students' performance in mathematics.

INTELLIGENCE

In general, Intelligence is cognitive ability and problem-solving skills. Also, other ability such as reasoning, preserving relationships, analogies, calculating and learning ability etc are involved in the cognitive ability. According to Gardner, Intelligence is the composition of seven component such as musical, bodily- kinaesthetic, logical-mathematical, linguistic, spatial, and interpersonal. Intelligence is a general mental power or composition of mental power which is measured by a single score. Normally, we say that more intelligence students get higher score in mathematics than less intelligences students. Fernandez (2011) noted that a positive relationship between intelligence and specific area of mathematics achievement. Das (1986), Patel (1997), Kasat (1991) and Abdul Majeed (1992) found that positive correlation between

intelligence and achievement in mathematics.

SELF-CONCEPT

Mainly, Self-concept has three key point such as perceptual, conceptual and attitudinal. Perceptual is the image of the person that is apparencey of body and the impression on other. Conceptual is the person's conception of his distinctive characteristics, abilities, background and origin and future. Attitudinal is the feelings of the persons about himself, attitude, present status and future prospective. According to James (1980) there are four categories of self-concept: basic, the transitory, the social and the ideal. According to Cattell, "self-concept is the key stone of the personality development." Sidwai (1971) found that a positive correlation between academic ability and self-concept. Robinson (1976) reported that there is a positive correlation between self-concept and academic success.

STUDY HABITS

Study habit is one of most important factors that effect on student's performance in mathematics. If a student possesses a good study habits then his or her performance must be improved. Absence of this skill would lead the students to poor performance in school (Kaur and Pathania, 2015). Every day reading consists of individuals' reading activities for a variety of purposes, such as for relaxation or information (Issa, et al., 2012). There is a general sense in which one appreciates the link between good habits of reading and the academic performance of the students (Issa, et al., 2012). Guthrie, Benneth and McGough, (2007) believed that "reading" is the act of getting meaning from printed or written words, which is the basis for the learning and one of the most impotent skills in everyday life. Reading is usually associated with books as only the written words provide a complete picture of the act of reading (Issa, et al, 2012). Normally, due to lack of good reading habits among students, academic performance of the students, with respect to their examination result has been in dismay nowadays creating a great source of worry and concern for all stockholders in the educational sub-sector (Issa, et al, 2012). Ogbodo (2010) noted that there are three types of reading habits such as hobby, recreational and concentration.

ACHIEVEMENT IN MATHEMATICS

Achievement in mathematics is the amount of knowledge that derived from studying mathematics. The students gain knowledge by instructions receives at the school and organised a set of core activities in which a teacher assigns tasks to the students and evaluates. According to Levy (1942) academic achievement based on the number of factors that are students' attitudes, interest, personality and social class in addition to learning. Levy (1942) also defined over achievers as pupils whose school attainment is in excess of expectations formed on the basis of their activities. The over and under achievement concept suggest that there are many other additional variables which have the positive effect on the student's performance. Every teacher teaches all the students in the same guide line but all the students do not have same grade and high achievers in mathematics. There are many numbers of reasons such as different level of intelligence, lack of good infrastructural facilities, study habits, attentions and so on. According to Kulkarni (1970), "Mathematical achievement refers to understanding to mathematical concept, application of knowledge to new situations and logical reasoning as involved in interpretation of data, interpretation of missing link, etc."

REVIEW OF RELATED LITERATURE

Sridevi et al. (2008) in the study relationship of emotional intelligence, self-concept, adjustment and achievement of higher secondary students found that a positive correlation between achievement with intelligence and self-concept.

Subramanyam et al. (2008) noticed that there was no relationship between academic achievement and intelligence.

Richard (1976) noted that the students with higher score in biological science had high self-concept and found that positive correlation between achievement score in biology and self-concept.

Lee and Kung (2018) studied on the mathematics achievement and mathematics self-concept and found that there is a gender difference on mathematics self-concept and girls have the higher achievement in mathematics.

Crede and Kuncel (2008); Nuthana and Yenagi (2009) established that high achievers in mathematics have high study habits and low achievers in mathematics have low study habits and also found that students with better in reading and note taking, well prepared for examination and concentrate in study have better achievement in mathematics.

STATEMENT OF THE PROBLEM

The present study entitled as, “**Relationship among Intelligence, Self-concept, Study habits and Achievement in Mathematics of Secondary Students**”

OBJECTIVE OF THE PROBLEM

Intention of the researcher to measure the Intelligence, study habits and self-concept and to find out the relation of the variables with achievement in mathematics. So, the researcher fixed the following objectives:

1. To measure the Intelligence score of the secondary students.
2. To measure the Study habits, score of the secondary students.
3. To measure the Self-concept score of the secondary students.
4. To measure the Achievement score in Mathematics of secondary students.
5. To find out the relation among Intelligence, Self-concept, Study habits and Achievement in Mathematics score.

HYPOTHESIS

On the basis of the above objectives the researcher suggested the following objectives

H₀₁: There is no significant correlation between Intelligence and Achievement in Mathematics.

H₀₂: There is no significant correlation between Study habits and Achievement in Mathematics.

H₀₃: There is no significant correlation between Self-concept and Achievement in Mathematics.

Tools used

To collect the data researcher used some tools of which three tools standardized by the investigator and one is standardized tools. The following tools are:

- (i) Achievement in Mathematics (Developed and standardized by Investigator)
- (ii) Intelligence Test (Developed and standardized by the researcher)
- (iii) Study Habits Inventory (Developed and standardized by the researcher)
- (iv) Self-concept Questionnaire (Developed and standardized by R. K. Sarawat)

Sample

The sample consisted of 400 students of class IX (200 boys and 200 girls) taken from different secondary school of District Nadia of West Bengal Bord of Secondary School.

ANALYSIS AND FINDINGS

Descriptive statistics of the variables Achievement in Mathematics, Intelligence, Study habits and Self-concept of boys and girls.

Statistics	Achievement in Mathematics		Intelligence		Study habits		Self-concept	
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
N	200	200	200	200	200	200	200	200
Mean	24.48	18.04	21.71	15.53	83.45	88.73	162.79	161.63
Median	24.00	17	21.05	14.50	85.50	90	163.00	170
Mode	26	16	21	14	89	92	168	170
Std. Deviation	6.958	6.788	6.484	6.308	14.371	11.919	20.977	28.431
Variance	48.411	46.071	42.042	39.792	206.522	142.06	440.037	808.347
Skewness	0.211	1.202	0.012	0.589	-0.742	-0.919	-0.369	-1.905
Range	30	38	33	31	75	79	107	157
Minimum	11	4	5	3	39	34	101	48
Maximum	41	42	38	34	114	113	208	205
Sum	4896	3608	4342	3106	16690	17746	32558	32326

From above table, it is clear that mean of 200 boys' students in achievement in Mathematics is 24.48 and mean of 200 girls students in achievement in Mathematics is 18.04. Therefore, performance of achievement in Mathematics of boys is better than that of girls. The mean of 200 boys' students in Intelligence is 21.71 and mean of 200 girls students in Intelligence is 15.53. Therefore, the Intelligence of boy's students is better than of girl's students. The mean of 200 boys' students in Study habits is 83.45 and mean of 200 girls students in Study habits is 88.73. Therefore, Study habits of girl's students are than of boy's students. The mean of 200 boys' students of Self-concept is 162.79 and mean of 200 girls students of Self-concept is 161.63. Therefore, boys Self-concept is better than girls.

Analysis of data pertaining to H_{01} (H_{01} : There is no significant correlation between Intelligence and Achievement in Mathematics.)

Table-1
Showing correlation distribution of Intelligence with Achievement in Mathematics of Secondary students

Variables	N	'r'	Df	Critical value of 'r' at 5% level	Critical value of 'r' at 1% level	Level of Significance
Achievement in Mathematics	400	0.683	398	0.126	0.1652	Significant at both level
Intelligence	400					

The critical value of 'r' is 0.126 at 5% level of significant and 0.1652 at 1% level of significant. The computed value of 'r' is 0.683, which is significant at both levels. So, null hypothesis rejected and therefore, there is a correlation between Intelligence and Achievement in Mathematics and the value of correlation is 0.683.

Analysis of data pertaining to H₀₂ (H₀₂: There is no significant correlation between Study habits and Achievement in Mathematics.)

Table-2
Showing correlation distribution of Study habits with Achievement in Mathematics of Secondary students

Variables	N	'r'	df	Critical value of 'r' at 5% level	Critical value of 'r' at 1% level	Level of Significance
Achievement in Mathematics	400	0.316	398	0.126	0.1652	Significant at both level
Study habits	400					

The critical value of 'r' is 0.126 at 5% level of significant and 0.1652 at 1% level of significant. The computed value of 'r' is 0.316, which is significant at both levels. So, null hypothesis rejected and therefore, there is a correlation between Study habits and Achievement in Mathematics and the value of correlation is 0.361.

Analysis of data pertaining to H₀₃ (H₀₃: There is no significant correlation between Self-concept and Achievement in Mathematics.)

Table-3
Showing correlation distribution of Self-concept with Achievement in Mathematics of Secondary students

Variables	N	'r'	df	Critical value of 'r' at 5% level	Critical value of 'r' at 1% level	Level of Significance
Achievement in Mathematics	400	0.282	398	0.126	0.1652	Significant at both level
Self-concept	400					

The critical value of 'r' is 0.126 at 5% level of significant and 0.1652 at 1% level of significant. The computed value of 'r' is 0.282, which is significant at both levels. So, null hypothesis rejected and therefore, there is a correlation between Self-concept and Achievement in Mathematics and the value of correlation is 0.282.

CONCLUSION

The above study concludes that there are significant correlations between Achievement in Mathematics and Intelligence (r=0.683); Achievement in Mathematics and Study habits (r=0.316); Achievement in Mathematics and Self-concept (r=0.282). Among the variables Intelligence strongly correlated with Achievement in Mathematics in comparison to Study habits and Self-concept.

REFERENCES

- Credé, M. & Kuncel, N. R. (2008). Study habits, skills, and attitudes: The third pillar supporting collegiate academic performance. *Perspectives on Psychological Science*, 3(6), 425-453.
- Fernandez, S.F. (2011). Brain hemisphere and mathematics achievement of high school students (ED537715). Online submission, M.A. Thesis, West Visayas State University
- Guthrie, J. T. Benneth, L. & McGough, K. (2007). Concept-oriented Reading Instruction: An Integrated Curriculum to Develop Motivation and Strategies for Reading. <http://curry.virginia.edu/go/clic/ntricorri.rio.html>. Retrieved on November, 20, 2013.
- Issa, A. O., Aliyu, M. B., Akangbe, R. B. & Adedeji, A. F. (2012). Reading Interest and Habits of the Federal Polytechnic Students. *International Journal of Learning & Development* 2(1), 470-486.
- Kaur, A., & Pathania, R. (2015). Study habits and academic performance among late adolescents. *Studies on Home and Community Science*, 9(1), 33-35. <https://doi.org/10.1080/09737189.2015.11885430>
- Kulkarni, S.S. (1970). All India Survey of Achievement in Mathematics. *Indian Educational Review*, 30(1), 1-20.
- Levy, D.M. (1942) *Maternal and Protection*, New York, Columbia University Press. Manger and Eikeland (2006) Manger, T. and Eikeland, O. (1998). The Effect of Mathematics Self-Concept on Girls' and Boys' Mathematical Achievement. *School Psychology International*, 19(1), pp. 5-18.
- Lee, C. and Kung, H. (2018). Math Self-Concept and Mathematics Achievement: Examining Gender Variation and Reciprocal Relations among Junior High School Students in Taiwan. *Eurasia Journal of Mathematics, Science and Technology Education*, 14(4), 1239-1252. <https://doi.org/10.29333/ejmste/82535>
- Mohamed, L., & Waheed, H. (2011). Secondary students' attitude towards mathematics in a selected school of Maldives. *International Journal of humanities and social science*, 1(15), 277-281. Retrieved from <http://bit.ly/2VU1IVA>
- Nuthana, P., & Yenagi, G. V. (2009). Influence of study habits, self-concept on academic achievement of boys and girls. *Karnataka J. Agric. Sci*, 22 (5), 1135-1138.
- Ogbodo, R. O. (2010). Effective Study Habits in Educational Sector: Counselling Implications. *Edo Journal of Counselling*, 3(2), 1-11.
- Orton, A., & Frobisher, L. (2004). *Insights into teaching mathematics*. A&C Black. Retrieved from <http://bit.ly/2IDPL3b>